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ONTARIO WATER RESOURCES COMMISSION

ANNUAL REPORT 1965

NEWMARKET

AREA

water pollution control plant

DIVISION OF PLANT OPERATIONS

Ontario Water Resources Commission

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ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of the Newmarket-East Gwillimbury Local
Advisory Committee,
Town of Newmarket and Township of East Gwillimbury.

Gentlemen:

I am pleased to provide you with the 1965 Annual Report for the Newmarket-East Gwillimbury Water Pollution Control Plant, OWRC Project No. 61-S-87.

We appreciate the co-operation you have extended to our Operations staff throughout the year, and trust that continuation of this close association will ensure even greater progress in the sphere of water pollution control.

Yours very truly,

D. S. Caverly,
General Manager.

ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

J. A. VANCE, LL.D.
CHAIRMAN

J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MacDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to provide you with the 1965 Annual Report on the operation of the Newmarket-East Gwillimbury Water Pollution Control Plant, OWRC Project No. 61-S-87.

The report presents design data, outlines operating problems encountered during the year and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

This report provides useful information on the operating efficiency of this project during 1965. It is intended to act as a guide in gauging plant performance. To implement that aim, it includes detailed statistical and cost data, a description of the project and a summary of its operation during the year.

Of particular interest will be the cost data, which show the total cost to the municipality and the areas of major expenditure.

The Regional Operations Engineer is primarily responsible for the preparation of the report, and has compiled and arranged the material. He will be pleased to answer any questions regarding it. Other groups, however, were involved in the production, and these include the statistics section, the Drafting Section of the Division of Sanitary Engineering and the Division of Finance.

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

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NEWMARKET AREA

water pollution control plant

operated for

THE TOWN OF NEWMARKET

and

THE TOWNSHIP OF EAST GWILLIMBURY

by the

ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN: Dr. James A. Vance

VICE-CHAIRMAN: J. H. H. Root, M.P.P.

COMMISSIONERS

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D. A. Moodie
H. E. Brown
L. E. Venchiarutti

GENERAL MANAGER: D. S. Caverly

ASSISTANT GENERAL MANAGERS

L. E. Owers
F. A. Voege
K. H. Sharpe
A. K. Watt

COMMISSION SECRETARY

W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

DIRECTOR: B. C. Palmer

Assistant Director: C. W. Perry
Regional Supervisor: D. A. McTavish
Operations Engineer: R. Kauppinen

801 Bay Street Toronto 5

'65 REVIEW

This was the first full year of operation at the Newmarket-East Gwillimbury Water Pollution Control Plant.

The total operating cost for the year was $32,566.48. Payroll, Power and Sundry items accounted for the largest portion of the total cost at 83 percent.

A total of 476.23 million gallons of raw sewage was treated at a cost of $68.38 per million gallons or $14.94 per family per year. The cost in terms of BOD removal was four cents per pound.

The average daily flow in 1965 was 1.31 mgd, which was 0.69 mgd below the average dry weather design flow. The average BOD and suspended solids removals for full treatment were 90.5 percent and 83.0 percent respectively.

The one year maintenance period expired in September and most of the outstanding deficiencies were corrected. One of the major deficiencies was the aerator units and in 1965 tests were carried out on these units. As a result some modifications were made to the aerator units. However the units have not yet been finally accepted for the plant and were to remain under observation for a further period of time.

GLOSSARY

BOD	biochemical oxygen demand (a measure of organic content)
cfm	cubic feet per minute
comminution	shredding of solids into small fragments
DWF	dry weather flow
effluent	outflow
flocculation	bringing very small particles together to form a larger mass (the floc) before settling
fps	feet per second
gpcd	gallons per capita per day
gpm	gallons per minute
grit	sand, dust, stones, cinders and other heavy inorganic material
influent	inflow
lin. ft.	lineal feet
mgd	million gallons per day
mlss	mixed liquor suspended solids
ppm	parts per million
ss	suspended solids
TDH	total dynamic head (usually refers to pressure on a pump when it is in operation)

HISTORY
1961 - 1965

INCEPTION

In 1961 the Town of Newmarket and the Township of East Gwillimbury initiated plans for the construction of an activated water pollution control plant.

The firm of James F. MacLaren Limited, Consulting Engineers, were engaged to prepare plans and specifications for the project.

APPROVAL

In November 1961, the Town and the Township signed an agreement with the Ontario Water Resources Commission to finance, construct and operate the plant.

CONSTRUCTION

Russell Construction Limited began construction in the summer of 1963 and the Division of Plant Operations commenced operation of the project in the summer of 1964.

TOTAL COST $986,035.30

Project Staff

Chief Operator: G. M. Smith

Operators: K. B. McClelland
J. W. Taylor

COMMENTS

G. M. Smith was hired as Chief Operator of the plant in August, 1964. Mr. Smith was formerly an operator at the North Bay Water Pollution Control plant.

K. B. McClelland and J. W. Taylor were also hired at the same time as plant operators.

Mr. Smith received his Certificate of Qualification as an Operator of Water Pollution Control Works.

In 1965, Mr. Taylor and Mr. McClelland began taking the same courses in order to obtain their certificates.

The plant is under 8 hours supervision seven days a week.



Description of Project

INFLUENT WORKS

The influent piping is designed to accommodate a maximum flow of 15.0 mgd.

Raw sewage enters the plant through a 30 inch diameter sewer and flows by gravity to a screening chamber. Flows in excess of 15.0 mgd are by-passed through a by-pass manhole to a 30 inch diameter sewer that leads directly to the Holland River.

The screening chamber located at the entrance to the wet well consists of a channel and provisions for a second channel at a later date. The channel is provided with a coarse screen, Barminutor, and Parshall flume. Large particles are removed from the flow by the coarse screens. Finer particles including rags and paper are shredded by the knife-edged teeth of the Barminutor. The Parshall flume in conjunction with a chart recorder measures flows entering the wet well.

From the wet well the raw sewage is pumped to a height of 30 feet to an aerated grit chamber where only the heavy grit particles settle out of the flow. This is accomplished by decreasing the velocity of flow to facilitate settling of the grit and forcing compressed air into the tank to keep the organic solids in suspension. Accumulated grit in the tank is carried by air lifts to a decanting trough where it is removed manually and trucked away from the plant.

PRIMARY SEDIMENTATION

The flow is then directed to the primary settling tanks where it is detained for a period of 1.57 hours. About 47.5% of the suspended solids settle and are collected by sludge scrappers at the bottom of the tanks and directed to a sludge hopper. Scum is collected by skimmers on the surface and is also directed to the sludge hopper.

The raw sludge and scum are pumped by raw sludge pumps to the primary digester. The primary effluent is directed either to the aeration tanks for secondary treatment or to a by-pass line leading to the chlorine contact chamber.

AERATION

In the aeration tanks the primary effluent is mixed with the return activated sludge and aerated by mechanical aerators. About 43% of the suspended solids are removed in the aeration process by means of aerobic action. The flow is retained for 8.0 hours at design loading in the aeration tanks and then directed to the final sedimentation tanks.

FINAL SEDIMENTATION

The flow is retained in the final tanks for a period of 2.6 hours at design loadings. Activated sludge from the aeration section settles out of the flow and is moved to a sludge hopper by sludge scrappers. Return sludge pumps pump the activated sludge to a splitter box where part is wasted to the primary settling tanks and part is returned to the aeration tanks. The final effluent is directed to the chlorine contact chamber.

CHLORINATION

The effluent is retained in the chlorine contact chamber for 39.0 minutes at design flow. A chlorine residual of 0.5 ppm is maintained during the contact period to ensure complete destruction of the pathogenic bacteria before the effluent is discharged to the Holland River.

SLUDGE DIGESTION

Two stage digestion is utilized at the plant. Raw sludge, waste activated sludge, and scum are pumped from the primary settling tanks to the primary digester. The contents are mixed by gas recirculation equipment that works integrally with the floating digester roof and is recirculated through a heat exchanger to bring the mixture up to the proper temperature. After a period of time, the mixture is transferred to the secondary digester by gravity to complete the process of anaerobic digestion and to allow the mixture to become quiescent.

The digester gas is directed to the boiler where it is utilized as boiler fuel or to a waste gas burner located outside the digester. The liquid supernatant is returned periodically to the primary settling tanks where it undergoes treatment again and the digested sludge is hauled away by truck.



CHLORINE CONTACT CHAMBER

PROJECT COSTS

NET CAPITAL COST (Estimated)		$986,035.30
DEDUCT - Portion Financed by CMHC (Estimated)	$449,521.34	
- Payments from Municipalities	374,857.04	824,378.38
Long Term Debt to OWRC		$161,656.92
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1965		$ 6,075.11
Net Operating		$ 22,796.54
Debt Retirement		4,758.00
Reserve		5,774.00
Interest Charged		11,098.31
TOTAL		$ 44,426.85

RESERVE ACCOUNT

Balance at January 1, 1965	$ 678.00
Deposited by Municipality	5,774.00
Interest Earned	159.37
	$ 6,611.37
Less Expenditures	-
Balance at December 31, 1965	$ 6,611.37

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER
JAN	1305.48	1078.42		134.41			11.40	56.21		25.04	
FEB	1683.23	1071.94			502.16		30.37			38.76	40.00
MARCH	4634.79	1095.46		385.73	529.75		83.95	185.67	26.04	2312.19	16.00
APRIL	2029.63	1246.50		115.65	548.62	17.30	29.07			48.49	24.00
MAY	2932.92	1754.00		220.26	498.36		213.65	103.94	46.48	80.23	16.00
JUNE	4301.25	1159.14	120.00	139.00	430.19	672.08	43.92	21.24	250.89	1440.79	24.00
JULY	2263.97	1167.46	108.00	117.73	452.31	47.92	150.25		3.50	200.80	16.00
AUG	3159.12	1142.18	413.00		497.14	560.06	107.47	16.38	28.53	354.36	40.00
SEPT	2020.06	1142.18	25.64		470.26		35.81	120.53		201.64	24.00
OCT	3058.07	1722.75		113.84	470.26	448.05	140.65	77.32	9.01	60.19	16.00
NOV	2051.43	1178.91		118.01	523.62		119.93	8.25	36.63	50.08	16.00
DEC	3126.53	1172.09			1213.44		116.15	100.68	18.60	489.59	16.00
TOTAL	32566.48	14931.03	666.64	1344.63	6136.11	1745.41	1082.60	690.22	419.68	5302.16	248.00

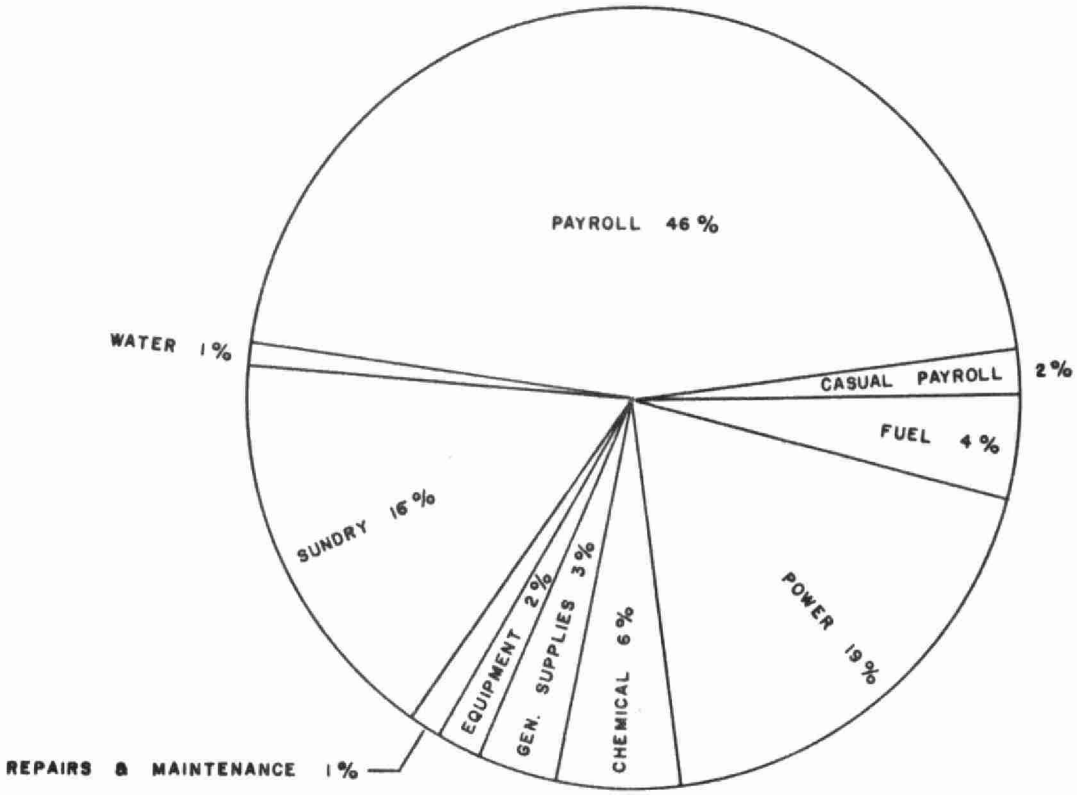
* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $834.30

YEARLY OPERATING COSTS

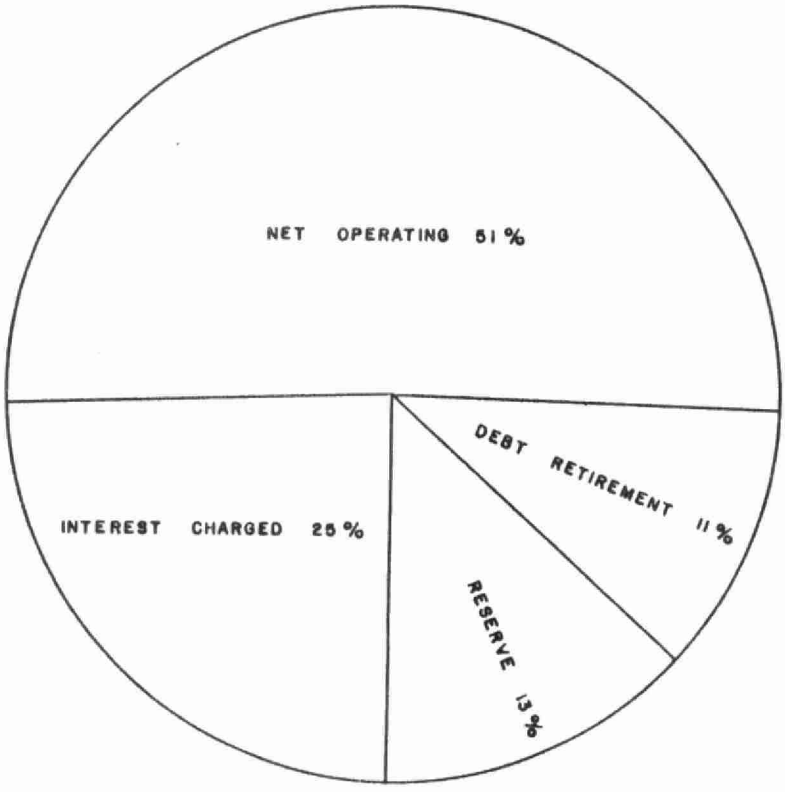
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER LB. OF BOD REMOVED
1965	476.231	$32566.48	* $ 14.94	$ 68.38	4 CENTS

* BASED ON ESTIMATED ANNUAL POPULATION AND 3.9 PERSONS PER FAMILY

1965 OPERATING COSTS

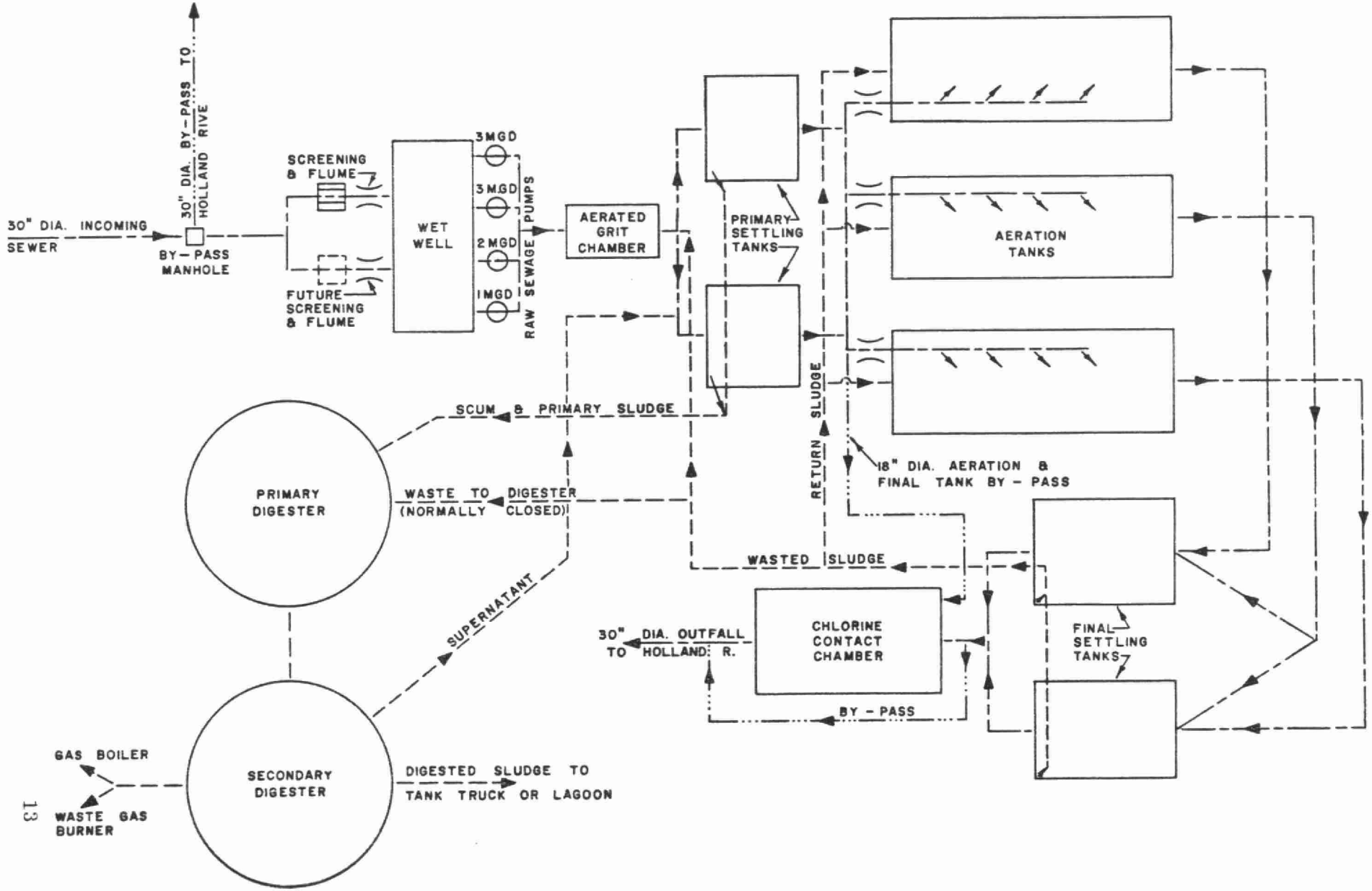


TOTAL ANNUAL COST



Technical Section

FLOW CHART


30" DIA. INCOMING SEWER
30" DIA. BY-PASS TO HOLLAND RIVE
BY-PASS MANHOLE
SCREENING & FLUME
FUTURE SCREENING & FLUME
WET WELL
3MGD
3MGD
2MGD
1MGD
RAW SEWAGE PUMPS
AERATED GRIT CHAMBER
PRIMARY SETTLING TANKS
AERATION TANKS
RETURN SLUDGE
18" DIA. AERATION & FINAL TANK BY-PASS
SCUM & PRIMARY SLUDGE
PRIMARY DIGESTER
WASTE TO DIGESTER (NORMALLY CLOSED)
WASTED SLUDGE
SUPERNATANT
30" DIA. OUTFALL TO HOLLAND R.
CHLORINE CONTACT CHAMBER
FINAL SETTLING TANKS
BY-PASS
GAS BOILER
WASTE GAS BURNER
SECONDARY DIGESTER
DIGESTED SLUDGE TO TANK TRUCK OR LAGOON

Design-Data

GENERAL

Type of Plant - Activated sludge

Design Population -

Newmarket - 9,200 persons
E. Gwillimbury - 10,000 persons

Estimated Flow in MGD (Design):

Minimum flow - 1.0
Average dry weather flow - 2.0

Maximum flow:

Primary Treatment -5.0
Secondary Treatment -3.0

Estimated Flow in MGD (Ultimate):

Minimum flow - 3.0
Average dry weather flow - 6.0

Maximum flow:

Primary Treatment -15.0
Secondary Treatment - 9.0

Five Day BOD -

Raw Sewage - 220 ppm
Removal:-
Primary Treatment - 30%
Secondary Treatment - 90%

Suspended Solids

Raw Sewage - 212 ppm
Removal:-
Primary Treatment - 47.5%
Secondary Treatment - 90.0%

INFLUENT WORKS

Inlet Sewer

30 inch diameter
Maximum capacity - 150 mgd.

Bypass Manhole

Overflow weir adjustable over a 15 inch range.
Initially weir set so bypassing occurs after flow of 5.0 mgd to plant.

Inlet Channels and Screens

Two inlet channels - 3 ft. x 6 ft. 6 in.
East inlet channel provided with bar screen with 1 inch openings.
Comminutor "Worthington" type 25 VV 6 complete with motor installed in main channel only.
Comminutor can handle:-
Minimum flow of 1.0 mgd.
Average flow of 2.0 mgd.
Maximum flow of 7.5 mgd.

Parshall Flume

Only one located in main inlet channel at entrance to wet well.
12 in. throat -capable of metering from 0.75 mgd to 7.5 mgd. Bubbler system actuates a bellows type pressure transmitter and transmits a signal linear to flow to totalizing, indicating and recording instruments.

Raw Sewage Wet Well

Two Smart Turner #8 WNV vertical dry well sewage pumps - 8 in. discharge and 10 in. suction.
Capacity pump - 1875 gpm at 30 ft. TDH.
Motor - 25 hp (Tamper), 900 rpm, 3/60/550.

Vertical solids shaft and drip proof.

One Smart Turner #8 WNV vertical dry well sewage pump -8 in. discharge and 10 in. suction.
Capacity - 1560 gpm at 30 ft. TDH.
Motor - 25 hp (Tamper), 3/60/550, 900 rpm.
Vertical solid shaft and drip proof.

One Smart Turner #6 WNV vertical dry well sewage pump - 6 in. discharge and 8 in. suction.
Capacity - 1,000 gpm at 30 ft. TDH.
Motor - 25 hp (Tamper), 3/60/500, 900 rpm.
Vertical solid shaft and drip proof.

Aeration Grit Chamber

Number of tanks - 2
Dimension - 14.25 x 6.0 x 9.11 (Side wall depth)
Total volume - 1560 cu. ft. = 9,700 gals.
Detention period:-
At 7.5 mgd - 1.86 minutes
At 5.0 mgd - 2.80 minutes
At 2.0 mgd - 7.0 minutes

Air Blower

Capacity - 130 scfm at 8.0 psi
Speed - 880 rpm
Motor - variable speed drive equal to US vari-drive type VEU, 3:1 speed ratio

Primary Settling Tanks

Number of tanks - 2
Dimension of each tank - 30 ft. x 30 ft. x 11.70 ft. (Side wall depth)
Total volume - 21,050 cu. ft. + 131,000 gallons.
Detention period:-
At 2.0 mgd - 1.57 hours
At 5.0 mgd - 0.63 hours
Surface settling rate at 2.0mgd - 1110 gallons per sq. ft. of tank per day.
Weir overflow rate at 2.0mgd - 1080 gallons per lin. ft. of weir per day.

Sludge collector

Bridge supported, rotary plow type manufactured by Dorr-Oliver-Long Ltd.

Sludge removal

Two Carter figure 800 duplex balto type plunger sludge pumps.

Capacity - 174 usgpm at TDH of 80 ft.
Motor - 10 hp (Tamper) drip proof, 3/60/550, 1200 rpm.

Scum removal

Scum pump
Capacity - 17 gpm at TDH of 170 ft.

Aeration Tanks

Parshall flumes located at entrance of each of the tanks.
Number of tanks - 3
Number of pockets - 12
Dimension of each pocket - 30 ft. x 30 ft. x 10.67.
Total volume of tanks - 107,500 cu. ft.
Detention period at 2.0 mgd - 8 hours
BOD loading on aeration tanks - 154 ppm = 3,080 lbs. per day.

Aeration equipment

12 Simcar mechanical aerators, each driven by 7.5 hp motors.
Speed - 30 rpm.
Oxygen input/set (lbs. of oxygen/hr.) 120 - 150.
Oxygen transfer efficiency (lbs. of oxygen/hp/hr.) - 4-5.
Pocket circulation rate - 5 minutes.

Final Settling Tank

Number of tanks - 3
Dimension of each tank - 30 ft. x 30 ft. x 13 ft.
Total volume - 35,000 cu. ft.
Detention period - 2.6 hours at 3.0 mgd.
Surface settling rate at 2.0 mgd - 740 gals./sq. ft. of tank/day.
Weir overflow rate at 2.0 mgd - 6,950 gals./lin. ft. of weir/day.
Sludge collector - bridge supported, rotary plow type

Return Sludge Pumps

Two Smart Turner #6 WWU Horizontal non-clog sewage pumps.

Capacity per pump - 1,050 gpm at TDH of 38 ft.
Motors - 2 US vari-drive, 20 hp, 3/60/550.
-2:1 variation, 1170 to 585 rpm.

Chlorine Contact Chamber

Dimension - 85 ft. 6 in. x 9 ft. 0 in. x 10 ft. 1 in.
Volume - 7,750 cu. ft. = 48,300 gals.
Contact period at 2.0 mgd - 39.7 min.
at 5.0 mgd - 13.9 min.

Digesters

Type - two stage digestion, both tanks have floating covers.
Dimension of tanks - 40 ft. dia. x21.25 and 40 ft. dia. x 23.00.
Total volume of tanks - 55,750 cu. ft.
Heated digester capacity - 2.9 lbs. solids/cu. ft. of tank/month.
Type of mixing - gas recirculation system integrated with floating roof.

Sludge Heat Exchanger

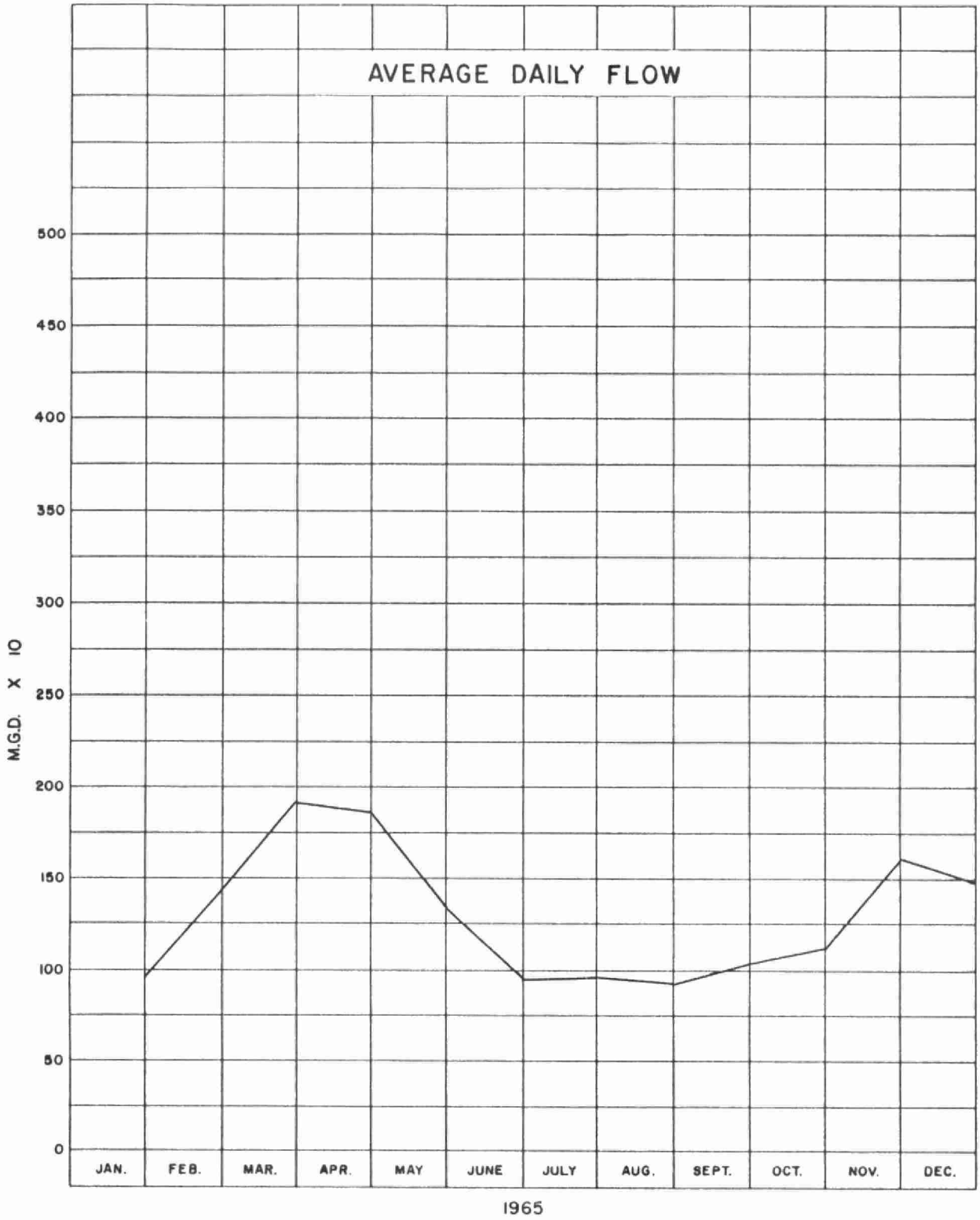
Type - Hot water, no. 65 spiral heat exchanger by Dorr-Oliver-Long Ltd.

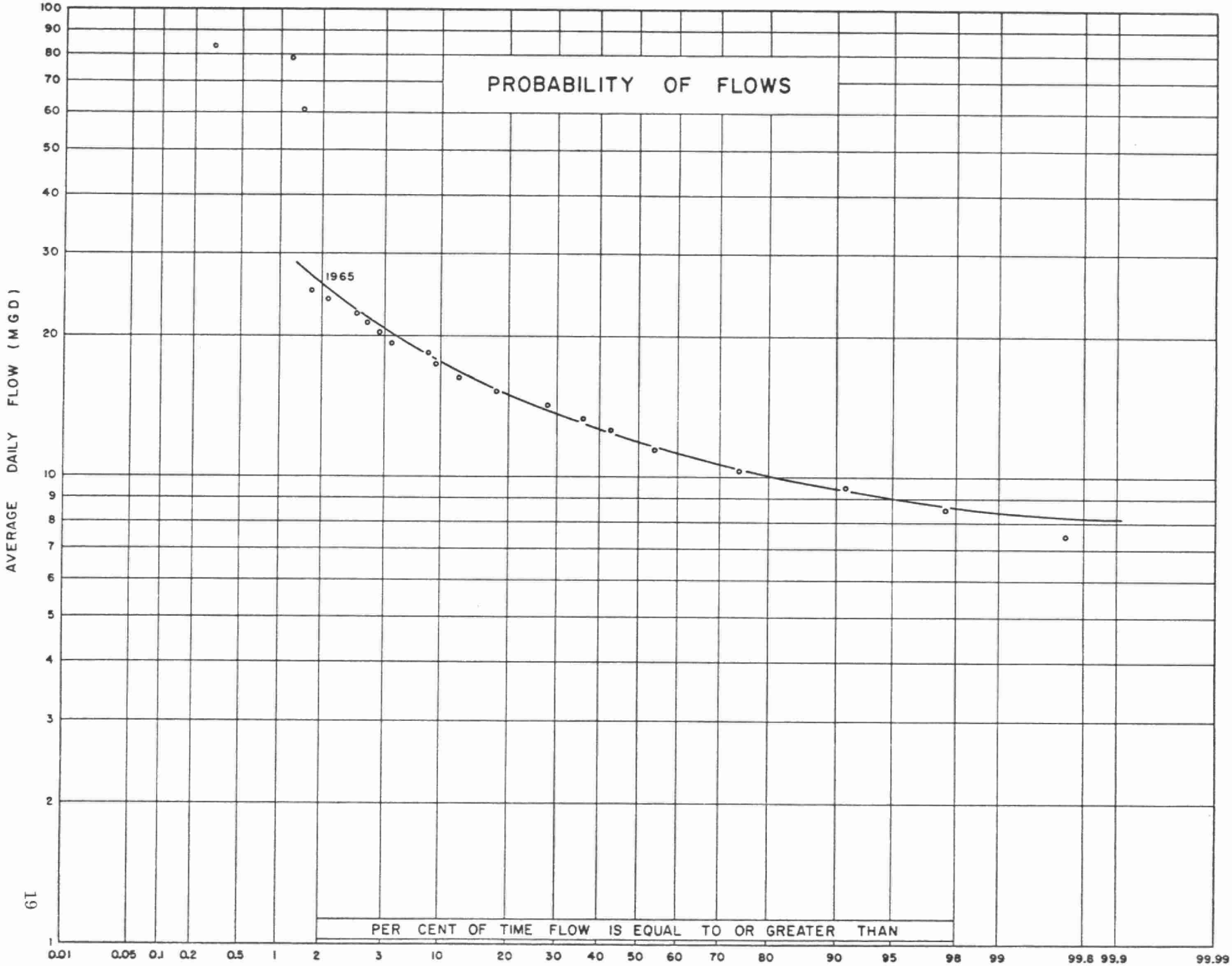
Recirculation Sludge Pumping Unit

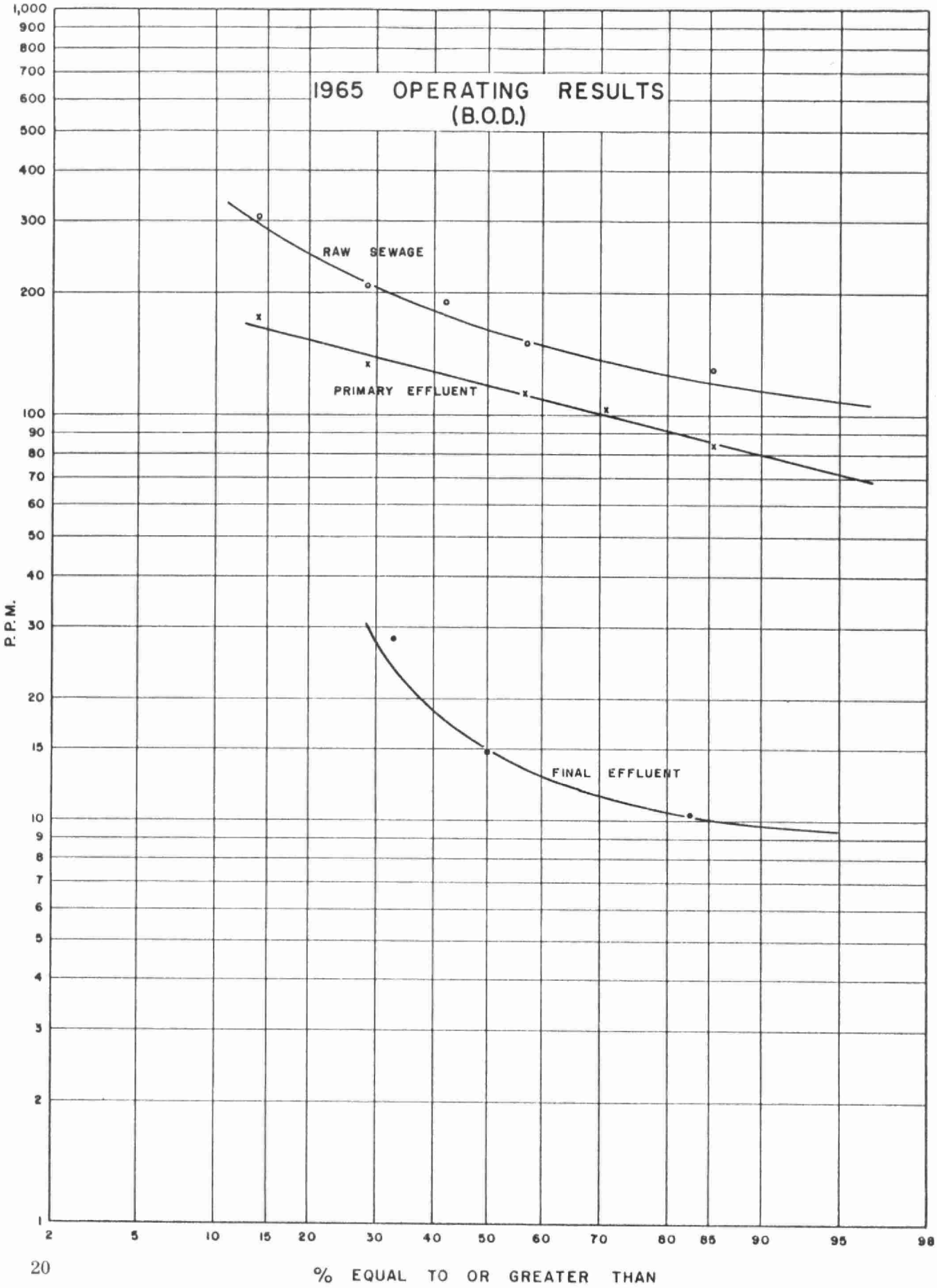
Sludge from primary digester recirculated through heat exchanger by model C Wemco Torque flow pump complete with one 7.5 hp, 1800 rpm, 3/60/550 electric motor.

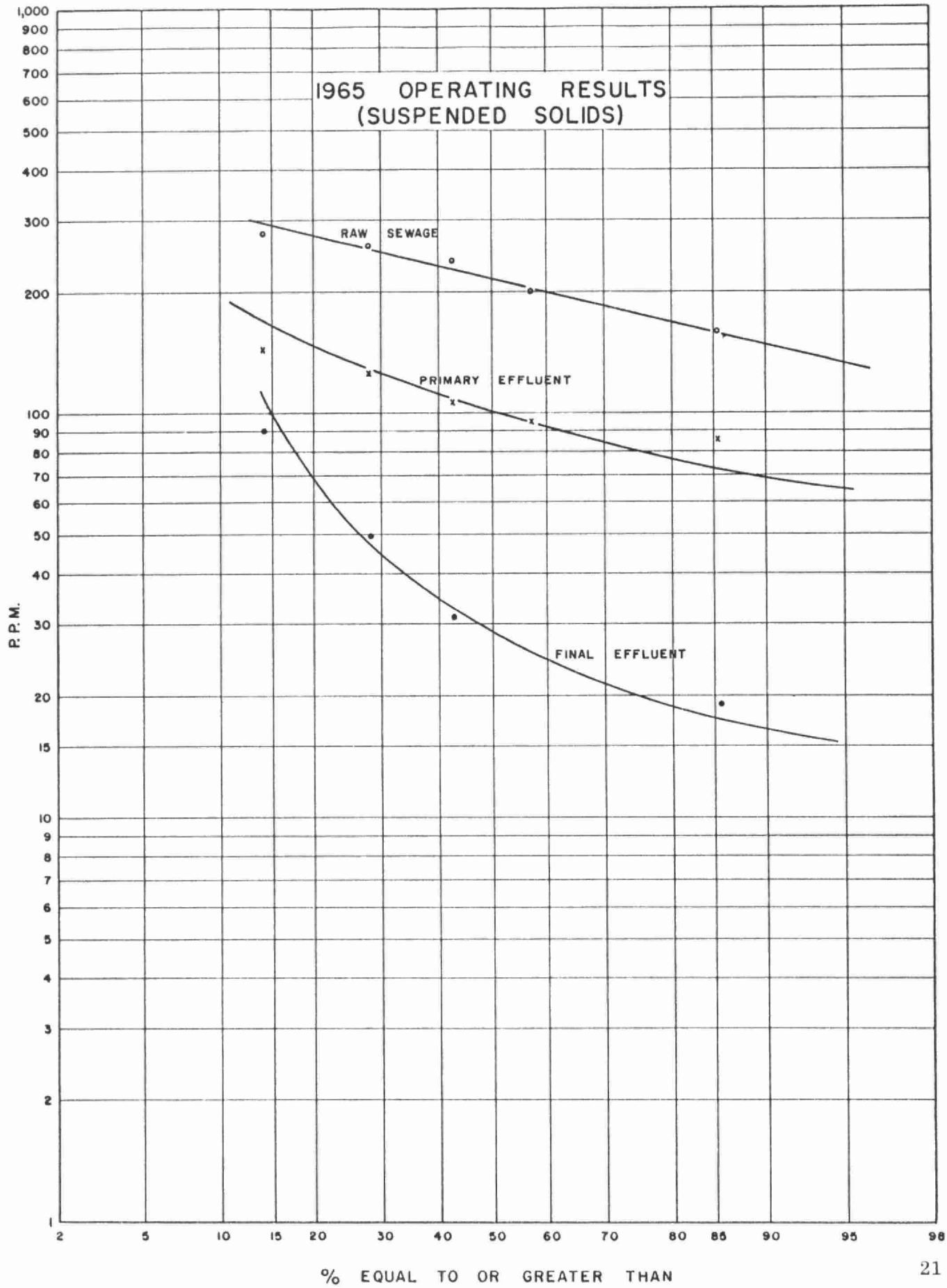
Process Data

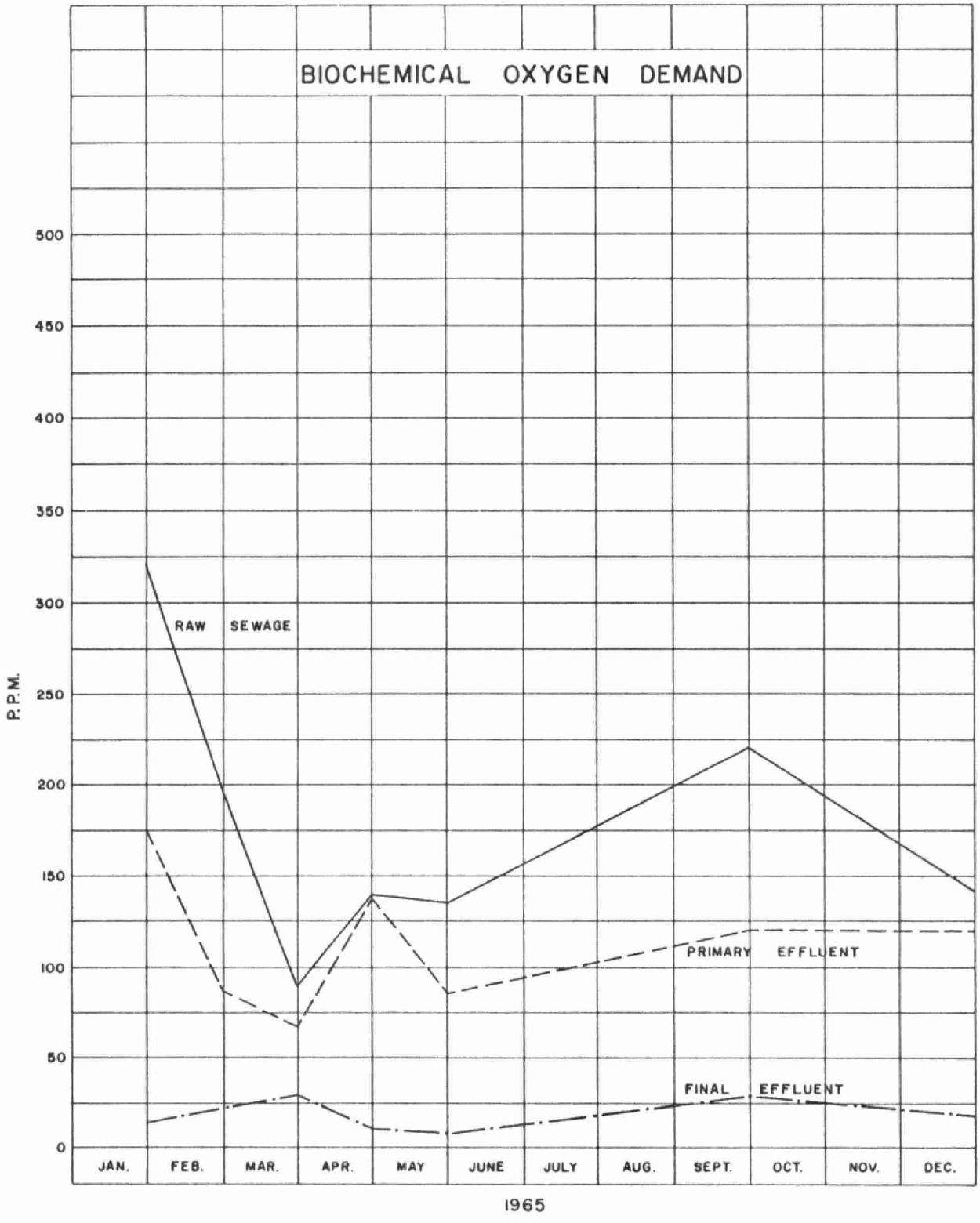
This was the first complete year that flow records were taken at the plant and as such the flows cannot be compared with those of previous years. The average daily flow for the year was 1.31 mgd. From the Probability of Flows Graph, it may be seen that only 6.0% of the time did the flows exceed the average dry weather design flow of 2.0 mgd.

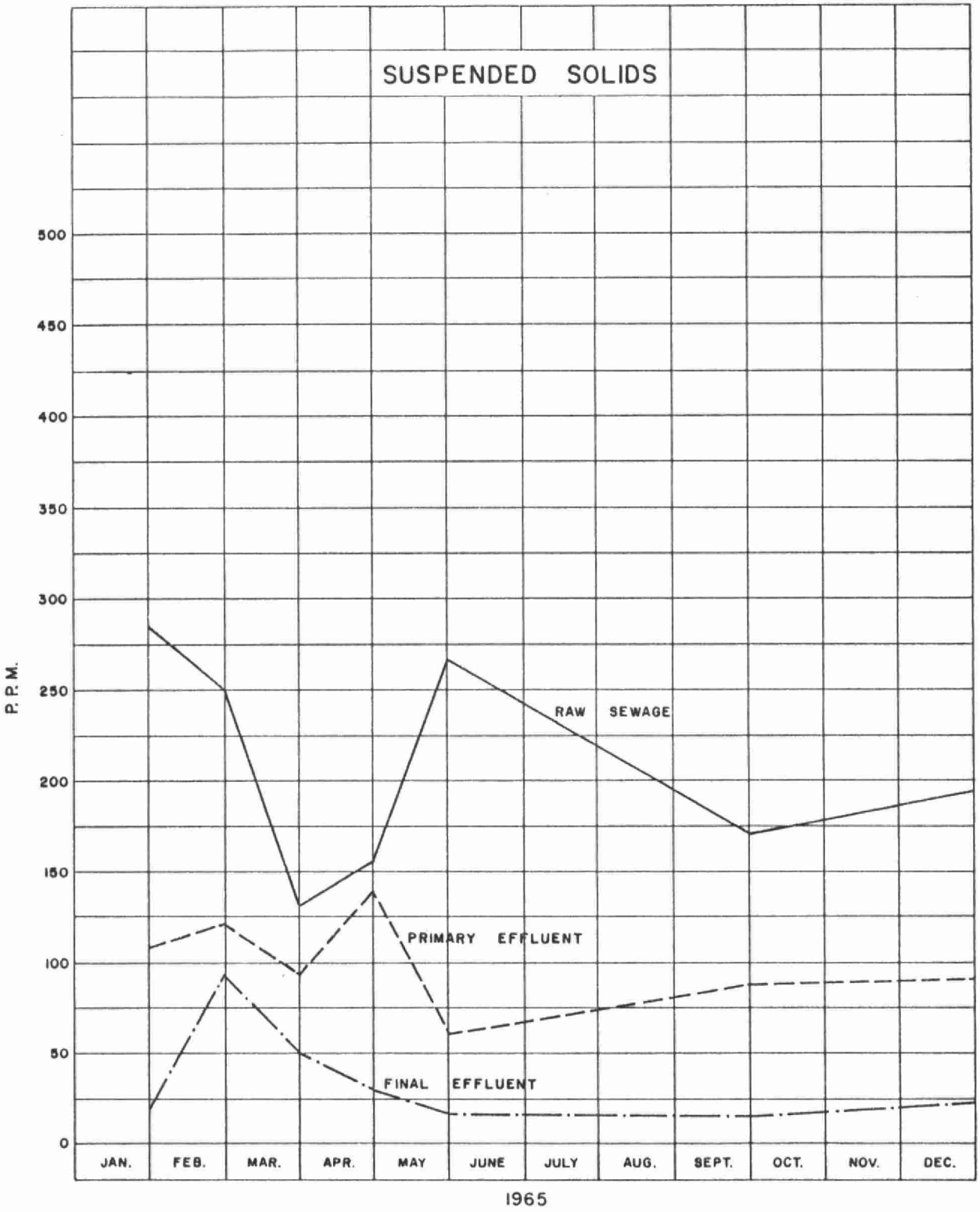

AVERAGE DAILY FLOW
M.G.D. X 10
500
450
400
350
300
250
200
150
100
50
0
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
1965


PROBABILITY OF FLOWS
1965
AVERAGE DAILY FLOW (MGD)
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
0.01
0.05
0.1
0.2
0.5
1
2
3
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
PER CENT OF TIME FLOW IS EQUAL TO OR GREATER THAN


1965 OPERATING RESULTS
(B.O.D.)
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
P.P.M.
% EQUAL TO OR GREATER THAN
1,000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
1
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98


1965 OPERATING RESULTS
(SUSPENDED SOLIDS)
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
P.P.M.
1,000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
1
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
% EQUAL TO OR GREATER THAN


BIOCHEMICAL OXYGEN DEMAND
P.P.M.
500
450
400
350
300
250
200
150
100
50
0
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
1965


SUSPENDED SOLIDS
P. P. M.
500
450
400
350
300
250
200
150
100
50
0
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
1965

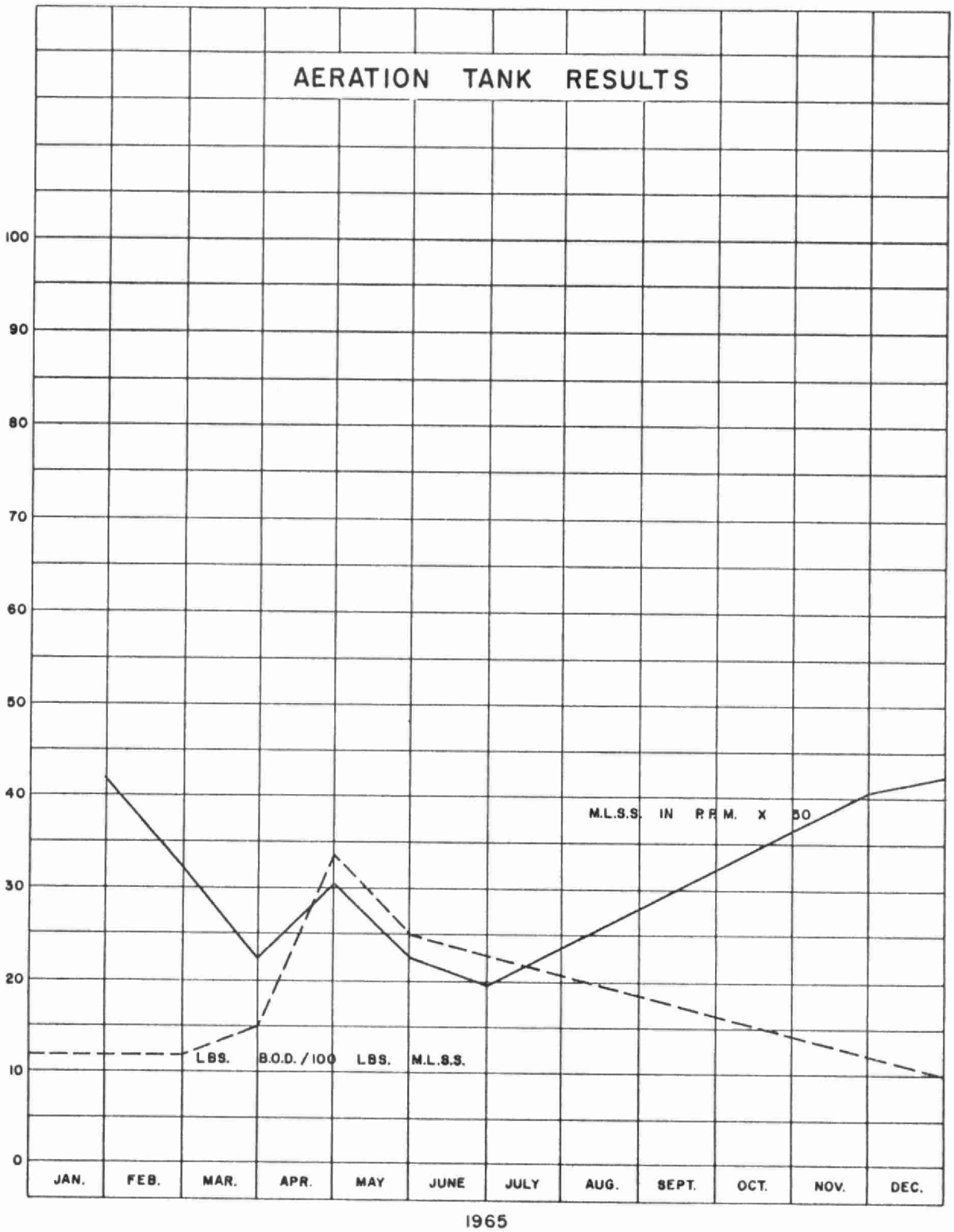
GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	
JAN.	320	15	95.5	44.7	286	18	93.5	39.3	-
FEB.	200	**	-	-	250	92	63.0	31.7	-
MAR.	84	28	66.5	16.6	130	50	61.5	23.7	-
APR.	140	10	93.0	36.4	155	30	80.5	35.0	-
MAY	135	8.8	93.5	25.8	266	17	93.5	50.9	-
JUNE	*177	17	90.5	23.0	*207	35	83.0	24.7	-
JULY	*177	17	90.5	23.7	*207	35	83.0	25.5	-
AUG.	*177	17	90.5	23.1	*207	35	83.0	24.8	-
SEPT.	220	28	87.0	29.7	170	16	90.5	23.8	-
OCT.	*177	17	90.5	30.2	*207	35	83.0	32.5	-
NOV.	*177	17	90.5	38.6	*207	35	83.0	41.5	-
DEC.	140	9.8	93.0	30.2	194	21	89.0	40.1	-
TOTAL	-	-	-	381.0	-	-	-	410.0	-
AVG.	177	17	90.5	31.8	207	35	83.0	34.2	-

* Average values substituted. No sample.
** No determination made.

COMMENTS

The average influent BOD was 177 ppm and the SS concentration was 207 ppm and these are well within the design criteria of the plant. The final effluent BOD was 90.5% and 83.0% respectively.


AERATION TANK RESULTS
100
90
80
70
60
50
40
30
20
10
0
M.L.S.S. IN P.P.M. X 50
LBS. B.O.D. / 100 LBS. M.L.S.S.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
1965

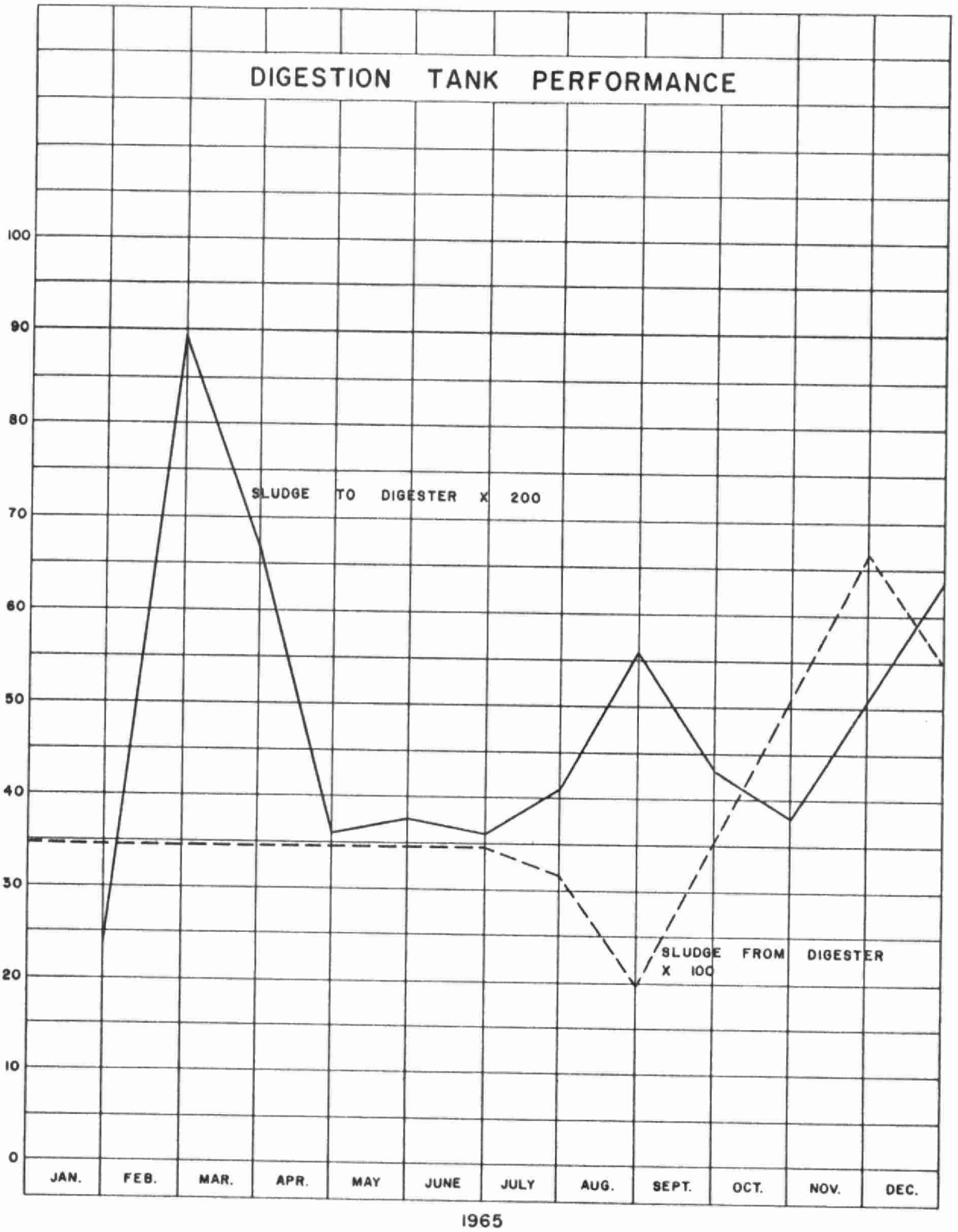
AERATION SECTION

MONTH	PRIM. EFFL. B.O.D. P.P.M.	M.L.S.S. P.P.M.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. B.O.D. REMOVED
JANUARY	180	2100	-	-
FEBRUARY	88	1646	12	-
MARCH	67	1118	15	-
APRIL	140	1267	34	-
MAY	110	1144	25	-
JUNE	-	989	-	-
JULY	-	* -	-	-
AUGUST	-	-	-	-
SEPTEMBER	120	-	-	-
OCTOBER	-	-	-	-
NOVEMBER	-	2040	-	-
DECEMBER	120	2133	11	-
TOTAL	-	-	-	-
AVERAGE	118	1555	19	-

* Aeration out of service.

COMMENTS

The aeration loadings indicate an average primary reduction in BOD of about 33%. The aeration loading of 19 pounds of BOD per 100 pounds of MLSS is on the low side of the range of 20 to 40 pounds of BOD per 100 pounds of MLSS that is usually specified. The plant utilizes mechanical aeration, therefore the air supply cannot be directly measured.


DIGESTION TANK PERFORMANCE
100
90
80
70
60
50
40
30
20
10
0
SLUDGE TO DIGESTER X 200
SLUDGE FROM DIGESTER X 100
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
1965

DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu. Ft
	1000'S CU FT	% SOLIDS	% VOL. MAT	1000'S CU FT.	% SOLIDS	% VOL. MAT	
JAN.	13.94	-	-	-	2.60	-	-
FEB.	28.63	0.30	-	-	4.59	-	-
MAR.	21.45	5.30	3.62	-	4.27	2.35	-
APR.	11.54	2.51	-	-	-	-	-
MAY	11.92	3.74	-	-	6.99	-	-
JUNE	8.85+	-	-	5.59	-	-	-
JULY	13.27	-	-	5.10	-	-	-
AUG.	17.88	-	-	3.16	-	-	-
SEPT.	13.65	5.21	-	0.49	12.85	5.57	-
OCT.	12.05	-	-	0.24	-	-	-
NOV.	16.92	-	-	9.72	-	-	-
DEC.	20.26	-	-	8.75	-	-	-
TOTAL	190.36	-	-	33.05	-	-	-
AVG.	15.86	3.41	3.62	4.72	6.26	3.96	-

+ This total does not include pumpage of dewatered sludge from aeration section taken down at this time.

COMMENTS

A total of 190,360 cubic feet of raw sludge was pumped to the digester and a total of 33,050 cubic feet of digested sludge was removed.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (P.P.M)
JANUARY	29.333	-	-
FEBRUARY	40.137	-	-
MARCH	59.351	-	-
APRIL	56.031	-	-
MAY	40.880	* 1132	6.13
JUNE	28.768	2487	8.64
JULY	29.645	2800	9.44
AUGUST	28.826	2262	7.85
SEPTEMBER	30.906	2500	8.09
OCTOBER	37.805	2783	7.36
NOVEMBER	48.221	-	-
DECEMBER	46.328	-	-
TOTAL	476.231	13964	-
AVERAGE	39.686	2327	8.01

* 14 days of chlorination

COMMENTS

Chlorination of the final effluent was carried out only six months of the year commencing in May and ending in October. A 0.5 ppm residual was maintained in the outfall pipe to insure adequate disinfection of the effluent before discharging it to the Holland River.

LABORATORY LIBRARY
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CONCLUSIONS

The plant was maintained and operated satisfactorily by the plant staff although the efficiency of removal was slightly below that expected of secondary treatment plants. Modifications were made to the aerator units during the latter part of the year which should improve the treatment.

RECOMMENDATIONS

The aerator units should be kept under observation for a further period of time before a final acceptance is made of them.

MAY 14 1970
JUN 17 1970
SEP - 2 1970


ONTARIO WATER RESOURCES COMMISSION